COMP 480/580 Probabilistic Algorithms and Data Structures

- 01/14 : Introduction, Logistics, Mark and Re-capture Estimation. Scribe Slide
- 01/16 : Brief Pseudo Randomness, Universal Hashing, Chaining, and Linear Probing.
- 01/21 : Compressed Cache and Bloom Filters. (Why caching does not kill your memory)
- 01/23 : Markov, Chebyshev's, and Chernoff Bounds.
- 01/28 : Analysis of Hashing, Chaining and Probing.
- 01/30 : Resizing Hash Tables: Consistent Hashing and balanced allocations.(The idea behind Akamai Technologies)
- 02/04 : SPOCA: A Stateless, Proportional, Optimally-Consistent Addressing Algorithm. (Best paper in USENIX 2011)
- 02/06 : Introduction to Stream Computing and Reservoir Sampling. (Algorithms at the Edges)
- 02/11 : Stream Estimation 1: Count-Min Sketch (Generalized Bloom Filters)
- 02/13 : Spring Break.
- 02/18 : Stream Estimation 2: Count-Sketches
- 02/20 : Stream Estimation 3: Count Distinct and Norm Estimation on Streams.
- 02/25 : Minwise Hashing, Near-Duplicate Detection and LSH 1. (What is "hash function" in this NY-Times article)
- 02/27 : Minwise Hashing, Near-Duplicate Detection and LSH 2.
- 03/03 : More LSH (Eliminate Pairwise Comparisons)
- 03/05 : Basic Sampling. (Beyond Random Sampling)
- 03/10 : Sampling Continued
- 03/12 : LSH as Computationally Efficient Importance Samplers. (Adaptive Sampling at the Cost of Random Sampling)
- 03/17 : Spring Break.
- 03/19 : Spring Break.
- 03/24 : In Class Mid-Term Exam.
- 03/26 : Markov Chains, Stationary distributions, MCMC 1 (Sampling in Complex Spaces).
- 03/31 : Markov Chains, Stationary distributions, MCMC 2
- 04/02 : Markov Chains, Stationary distributions, MCMC 3

- 04/07 : Markov Chains, Stationary distributions, MCMC 4.
- 04/09 : Markov Chains, Stationary distributions, MCMC 5.
- 04/14 : Estimation on Graphs
- 04/16 : Randomized Routing
- 04/21 : ACE and RACE Density Estimation (Analytics over Edge)
- 04/23 : Slack or Special Topics